PB86-218344

Guideline on the Identification and Use of Air Quality Data Affected by Exceptional Events

(U.S.) Environmental Protection Agency
Research Triangle Park, NC

Jul 86

U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-450/4-86-007
July 1986

Air

PB86-218344

EPA

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U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

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TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA 450/4-86-007	2.
3. RECIPIENT'S ACCESSION NO.	
4. TITLE AND SUBTITLE Guideline on the Identification and Use of Air Quality Data Affected by Exceptional Events	5. REPORT DATE July 1986
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO. EPA 450/4-86-007
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Environmental Protection Agency Monitoring and Data Analysis Division Monitoring and Reports Branch Monitoring Section, RTP, NC 27711	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Same as 9.	13. TYPE OF REPORT AND PERIOD COVERED Technical guideline
	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This guideline is intended to provide information to State and local air pollution control agencies concerning the flagging of air quality data affected by exceptional events. The guidance defines exceptional events, establishes uniform criteria and procedures for flagging air quality data, and provides a mechanism for allowing consideration of excluding flagged data.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Exceptional events Data flag Air quality data Excluding flagged data		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Unlimited	Unclassified	
	20. SECURITY CLASS *(This page)*	22. PRICE
	Unclassified	

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

EPA-450/4-86-007

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U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Radiation
Office of Air Quality Planning and Standards
Monitoring and Data Analysis Division
Research Triangle Park, NC 27711

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CONTENTS

1. INTRODUCTION 1

2. PURPOSE AND MANAGEMENT OF FLAGGING SYSTEM 5

2.1 Pre-Airs 5

2.2 Post-Airs 6

3. USES OF FLAGGED DATA 8

3.1 General Guidelines on the Use of Flagged Data 8

3.2 NAAQS Status 9

3.3 Trends Analysis 10

3.4 SIP Regulatory Activities 11

4. DEFINITION AND APPLICATION OF EXCEPTIONAL EVENTS 12

4.1 Definitions of Exceptional Events 12

4.1.1 General Exceptional Event Criteria 13

4.1.2 Specific Definitions 14

4.2 Demonstration of Causal Relation 24

4.3 Application of Definitions and/or Criteria 25

4.4 Documentation 26

APPENDIX 28

Development of Criteria for Possible Exceptional Events

I. Identification of Events 28

II. Events Not Considered Exceptional for Data Flagging Purposes 31

REFERENCES 34

SECTION 1

INTRODUCTION

Federal, State, and local air pollution control officials have expressed a great deal of concern regarding the handling of air quality data that are influenced by both natural and man-made events that are considered exceptional. These events are considered exceptional for two reasons; they are not expected to recur routinely at a given location, or they are possibly uncontrollable or unrealistic to control through the State Implementation Plan (SIP) process. In some cases in the past, air quality data collected during these "exceptional" events have not been submitted to the National Air Data Bank (NADB) because State or local agencies were concerned about the potential misuse of such data. This guideline document was prepared as a response to this concern and is intended to provide national guidance for identifying ("flagging") and using ambient air quality data influenced by exceptional events.

The guidance includes definitions of 18 acceptable exceptional events and describes the procedures for submitting flagged data influenced by these events to EPA's Aerometric Information Retrieval System (AIRS). The Appendix provides information on other events which were also initially proposed for consideration as "exceptional" but are not included in the final flagging system.

The need for a flagging (or "identification") system was implied in previous Agency guidelines and regulations. The first example is Office of Air Quality Planning and Standards' Guideline No. 1.2-008 (revised February 1977) entitled, "Guidelines for the Interpretation of Air Quality Standards."1

This guideline addressed the submission and use of all valid air quality data for determining an area's overall compliance status with respect to National Ambient Air Quality Standards (NAAQS). Issue 9 in the guideline posed the following question: "How should particulate matter (PM), carbon monoxide (CO), and other pollutant concentrations resulting from severe recurring dust storms, forest fires, volcanic activity, and other natural sources be taken into account in determining compliance with NAAQS?" The guideline recommended, "Regardless of the source, ambient pollutant concentrations exceeding a NAAQS constitute a violation." The guideline, however, implied a need for data flagging by further stating, "Detailed information establishing that violations are due to uncontrollable natural sources may be used in determining the feasibility of modifying control strategies."

The second example is in 40 CFR 51.12 (d), the regulations for the development, adoption, and submittal of SIP's.[2] The regulations stated: "For purposes of developing a control strategy, data derived from measurements of existing ambient levels of a pollutant may be adjusted to reflect the extent to which occasional natural or accidental phenomena, e.g., dust storms, forest fires, industrial accidents, demonstrably affected such ambient levels during the measurement period."

A third example is provided in the March 20, 1984, 40 CFR Part 50 Federal Register proposed revisions to the national ambient air quality standards for particulate matter.[3] Appendix K of Part 50 would allow consideration of the influence of rare or unusual events on PM_{10} data by various techniques.

All three examples, OAQPS 1.2-008, 40 CFR 51.12(d), and the proposed 40 CFR 50 Appendix K reflect concern that some air quality data associated with the occurrence of certain types of events may require special consideration in order to avoid misuse.

The guideline's general policy is to allow consideration of excluding flagged data from use in regulatory actions. The actual exclusion of the use of flagged data would only be allowed if, as a result of a public review process, the responsible government agency e.g., the State Air Agency during the State regulatory process, and the U. S. EPA during the Federal review/ approval process, determines that the data are inappropriate for use in a specific regulatory activity. This consideration for exclusion of flagged data carries with it no prior presumption towards use or non-use of flagged data.

By establishing uniform procedures and criteria for flagging and determining the use of data associated with exceptional events, EPA expects data collectors to submit to the NADB all valid ambient air quality data, i.e., data collected in accordance with 40 CFR 58. Having a complete national air quality data file will provide a data base adequate to evaluate and substantiate the impact of exceptional events on air quality and to assist users in interpreting the data.

The guideline provides criteria and procedures by which potential users of air quality data can be informed of "exceptional events" which may have influenced the data. The guideline has no regulatory or legal significance regarding use of any air quality data. Use or non-use of air quality data, whether flagged or not, must be subjected to full public disclosure and rulemaking procedures.

The criteria for identification of "exceptional events" are designed to be expansive enough to encompass most good faith claims by State and local agencies of when data should be considered for special treatment. It is not intended to reflect EPA's views on the validity of these claims. The flagging of data is merely a way for a State or local agency to state that it regards the data as influenced by exceptional events, and may later claim that the data should be discounted for certain purposes.

As experience with this guideline is gained, periodic revisions may be made. The guideline is to be implemented on a trial basis for approximately 2 years, after which the Standing Air Monitoring Work Group (SAMWG) will assess its effectiveness and make any appropriate recommendations for revision. The SAMWG is composed of Federal, State, and local air pollution control officials who constitute a forum for discussion and resolution of ambient air quality monitoring issues.

SECTION 2

PURPOSE AND MANAGEMENT OF THE FLAGGING SYSTEM

The basic purpose of the flagging system is to identify those air quality measurements that are influenced by exceptional events. These are events which, if unidentified, could lead to possible misinterpretation or misuse of the data. Because the flagging system relies heavily on the identification and understanding of events that may have influenced a particular air quality measurement, its major thrust is information exchange. If a particular air quality measurement is influenced by an exceptional event, it is important for all those who may review and ultimately use the data to be aware of this influence and to take care that such data are not misinterpreted or misused. Knowledge and understanding of what the data represent are critical in the overall air quality planning process.

Under the flagging system, State and local air pollution control agencies will be responsible for initially identifying and documenting data influenced by exceptional events. These agencies also must develop the appropriate background information used to support the decision to flag an individual piece of data; they must submit the information to EPA for concurrence and make it available for the public's review upon request. Because of the potential implications on the use of flagged data, the agency flagging the data must (as discussed in Section 4.2) clearly demonstrate a causality between the exceptional event and the flagged air quality data.

2.1 PRE-AIRS PROCEDURES

Until the Aerometric Information Retrieval System (AIRS) is operational, the flagged data should be specifically identified and discussed in the

annual State and Local Air Monitoring System (SLAMS) Report. The EPA Regional Offices will be responsible for review and concurrence or non-concurrence with the flag, except for data related to stratospheric ozone intrusions which will be reviewed and concurred or non-concurred with by OAQPS. States should initiate discussions with EPA Regional Offices regarding data that may be flagged as soon as possible after data collection, and should not wait until the annual SLAMS Report is submitted.

2.2 POST-AIRS PROCEDURES

After AIRS is operational, all flagged data will be entered and stored in the AIRS; and as data are retrieved, a user will be able to identify those data that have been flagged. Each exceptional event will be assigned a unique flag code by the AIRS for the exceptional events included in this guideline. The procedure for submitting, reviewing, and assigning appropriate flags for data identified by State or local agencies to be associated with an exceptional event are as follows:

(1) The State or local agency should submit their flagged data with the proper unique flag code to AIRS as part of their routine data submissions to EPA's data bank.

(2) The State or local agency should provide to the Regional Office, within 30 days, appropriate documentation and demonstration of causality as discussed in Section 4.4.

(3) The Regional Office should concur or non-concur with the data flag and notify the State or local agency within 30 days of receipt of documentation from the agency. If the Regional Office concurs with the flagging of the data, they will change the unique flag code associated with the data to

designate EPA Regional Office concurrence with the flag. If the Region non-concurs with the data flag, the State or local agency flag will remain in AIRS with the particular data point. The non-concurrence by the Regional Office could be revised upon subsequent submission of adequate justification by the State and local agency. The exception to the procedure is stratospheric ozone intrusion, which is to be reviewed and acted upon by OAQPS rather than the Regional Office.

(4) Those States electing to submit to NADB only an annual SLAMS report rather than raw data should include a section in their annual report which lists all flagged data, SAROAD I.D., date of occurrence, and type of acceptable exceptional event.

Notification must be sent to AIRS and the Regional Office by the responsible State or local agency when flagged data are to be changed to a nonflagged status for any reason.

Two data records will be maintained in AIRS. One record will contain all the data including the flagged data, and the other will contain only data that have not been flagged. All users of the data will have access to both records, including the rationale for the flag and the EPA Regional Office concurrence or non-concurrence with the flag.

SECTION 3

USES OF FLAGGED DATA

3.1 GENERAL GUIDELINES ON THE USE OF FLAGGED DATA

Concern over the potential for misuse has made some State and local agencies reluctant to submit air quality data that were influenced by what they consider to be an exceptional event, i.e., an event that is not expected to recur routinely at a given location, or that is possibly uncontrollable or unrealistic to control through the State Implementation Plan (SIP) process. The views of Federal, State, and local agency officials have varied concerning the use of air quality data collected during an exceptional event. Some believed that air quality data collected during an exceptional event should not be used under any circumstances; some believed that all valid (i.e., collected in accordance with 40 CFR 58) data should be used (without exception); some believed that the data should be used only to determine the status of the area with respect to the NAAQS; and still others believed that the data not only should be used to determine the compliance status of the area, but also to develop trends analyses and control strategies (with some qualifications). This document addresses these differences by requiring the States (and EPA) to identify and explain the use or non-use of data influenced by exceptional events during a public review process. Furthermore, the guidance provided does not dictate any prior presumption toward use or non-use for any specific purpose.

In general, decisions on the use or non-use of flagged data will be made on a case-by-case basis for specific purposes (attainment designations, control strategies, etc.), and the public must be informed that the data exist, whether

the data are used or not. The main concern lies with understanding what the flagged data represent. Three steps usually should be taken in order to decide whether questionable data should be flagged, and to assist potential users in determining how the data should be used. The first step is to determine the portion of the measured air quality level attributable to the single event, as well as the cumulative effect of several similar exceptional events, that create substantial impacts at a monitoring site. In some cases, modeling (either source apportionment or dispersion) or other procedures may be used to determine the relative contribution of the event. The relative contribution of the event provides a better understanding of what the air quality level for the day or days in question actually represents.

The second step is to determine the area influenced by the event. In most cases, the impact will be limited. Therefore, if the data are being considered for use in or exclusion from regulatory purposes, the agency should determine the area which would be influenced by the determination.

The third step is to demonstrate how the flagged data relate to data previously collected at the monitoring site. This step is extremely critical for trends analyses and for preparing reports to the public on air quality levels for a given area. Obviously, if flagged data are used or excluded in preparing summaries of air quality data, the reader should be made aware of how the data were used.

3.2 NAAQS Status

NAAQS compliance status involves the use of data to determine whether the area represented by the data is meeting or exceeding the NAAQS for the pollutant being monitored. It is EPA's policy and a regulatory requirement to have valid

NAMS and SLAMS data (i.e., data collected in accordance with 40 CFR 58) submitted to the NADB or included in the annual SLAMS report. All data, flagged or unflagged, should be available to the public for comparison to the NAAQS to determine if exceedances have occurred. All relevant flagged data along with the reasons for flagging, and a demonstration of causality between the exceptional event and the flagged data, shall be submitted for consideration of use/non-use during any public hearing or comment period called under Sections 107, 110-113, 119, 120, 122, 123, 126, Part C or Part D of the Clean Air Act.[4] Consideration of ambient air quality data during public reviews called under the authority of other sections or titles of the Clean Air Act, although not prohibited, does not appear to be relevant to the purpose of those reviews. For example, consideration of ambient data at a hearing held regarding automotive emissions standards may or may not be appropriate. Such consideration is neither mandatory nor prohibited.

3.3 Trends Analysis

Trends analysis involves the evaluation of the long-term trends associated with the measured levels of a given pollutant for a given area. These analyses are useful in evaluating the overall progress of the air pollution control program for the given pollutant and in understanding why the concentration levels of a pollutant are increasing or decreasing.

In some cases the data collected during an exceptional event can be used for trends analysis (as long as the analyst understands the limitations associated with the data). The trends analyses should clearly state how the flagged data were treated and to what extent the flagged data were or were not included in the analyses and why. The trends analyses also should consider

(to the extent possible) what effect the flagged data have on the overall trend line for the area in light of other confounding variables that may also affect the trend line.

3.4 SIP Regulatory Activities

The use of flagged air quality data for SIP regulatory activities (areawide or local control strategy development, SIP design values, attainment/non-attainment status, enforcement actions, etc.) shall be considered on a case-by-case basis and discussed during the public review process. Exclusion of the flagged data would only be allowed if the responsible control agency determines in conjunction with a public review that the flagged data are inappropriate for use.

SECTION 4

DEFINITION AND APPLICATION OF EXCEPTIONAL EVENTS

4.1 DEFINITIONS OF EXCEPTIONAL EVENTS

This guideline provides general definitions for these events and general criteria for their use in flagging air quality data. The application of a definition may vary from area to area because of differing air quality and control situations. For example, salting and sanding of streets for snow and ice control may be an exceptional event in the southern sections of the country, whereas they may be routine, controllable events in the northern sections. Therefore, the following definitions are only a national guide and are not meant to replace reasonable judgment on the part of the Regional, State, and local air pollution control agency officials in defining and identifying exceptional events for the purpose of flagging data.

In situations where it can be shown that the national criteria are generally inappropriate, a State Agency may propose alternate criteria to their EPA Regional office. These proposals would have to be subjected to public review within the State. The Regional office would be responsible for review and preliminary approval of the alternative criteria. The OAQPS will have final approval authority and if approved, will include the alternative criteria as a supplement to this national guideline.

With the above limitations in mind, the following general definitions have been developed to promote consistency with respect to flagging data that have been collected during an exceptional event. Whenever possible, specific criteria or terms have been used to define the event to minimize inconsistent interpretations. Of course, no term can be absolutely defined so that there is

no room for interpretation. Thus, these definitions and associated criteria provide for some flexibility in their application to an individual event. What may be unusual or exceptional for one part of the country may be typical for another and this variability requires flexibility in national definitions and criteria.

The definitions that follow have in some cases specific numbers included within the definition. Although they are not fully supported by technical studies, they are included as a practical alternative to deleting weakly supported values and, to the extent possible, reflect the comments received during development of this guideline. These numbers may require adjustments as experience is obtained with the guideline.

4.1.1 General Exceptional Event Criteria

Before one can define an individual exceptional event, one must have a general definition of "exceptional." In a sense, this definition also serves as an overriding criterion with regard to the specific definitions presented in 4.1.2.

Webster defines "exceptional" as forming an exception, rare, uncommon, extraordinary, deviating from the norm. With respect to air quality considerations in this guideline, an exceptional event is defined as an event that is not expected to recur routinely at a given location, or that is possibly uncontrollable or unrealistic to control through the SIP process. As noted previously, what is exceptional in one area of the country may not be exceptional in another. Therefore, some judgment is needed in identifying whether an event is exceptional in the area of the country where it has occurred.

4.1.2 Specific Definitions

The following definitions are provided for the purpose of identifying an exceptional event. Some additional discussion is provided in each case to aid in the application of these definitions.

HIGH WINDS (PM)

Definition:

An hourly windspeed of greater than or equal to 30 mph or gusts equal to or greater than 40 mph, with no precipitation[5,6] or only a trace of precipitation (observed as scattered drops that do not completely wet or cover an exposed area up to a rate of 0.01 inch/hr.[7]).

The high wind condition with no precipitation or only light precipitation and dry soil must be associated with a significant contribution (estimated to be $\geq$ 85% by weight) of crustal material on the PM sampling medium. High winds without unusually high PM levels due to the suspension or resuspension of crustal material should not be considered an exceptional event. Additionally, fugitive emissions or dust from any part of an industrial source should not be flagged.

STRATOSPHERIC OZONE INTRUSION (O_3)

Definition:

A stratospheric ozone intrusion occurs when a parcel of air originating in the stratosphere, average height 20 km (12.4 mi),[8] is entrained directly to the surface of the earth.

Although this event is exceptional, the circumstances or the criteria under which it occurs are difficult to measure or document given current

measured meteorological parameters. Stratospheric ozone intrusions are infrequent and very localized events of short duration, which makes it difficult to use currently available airport data to determine whether a stratospheric ozone intrusion has occurred. Stratospheric ozone intrusions are typically associated with strong frontal passages or severe thunderstorms and, thus, may occur primarily during the spring of the year. The above definition is provided only as a general guide for differentiating between stratospheric ozone intrusion, which is an exceptional event for the purpose of flagging data, and other nonexceptional meteorological events. Although data have been identified in the past as being the result of stratospheric ozone intrusion, no standard definition or criteria have been established for concrete identification. Therefore, determining whether a stratospheric ozone intrusion has occurred should be a case-by-case decision based on reasonable judgment regarding the season of the year, time of day, and accompanying meteorological conditions associated with the ozone measurement in question. The EPA concurrence or non-concurrence authority for flagging of ozone data for stratospheric intrusion is the responsibility of OAQPS upon review of the documentation submitted by the State or local agency flagging the ozone data.

VOLCANIC ERUPTIONS (CO, SO_2, NO_2, PM)

Definition:

The emission or ejection of volcanic materials at the Earth's surface from a crater or fissure.[9]

Emissions from volcanic eruptions have a large-scale areawide impact on air quality. Excessive air quality concentrations resulting from volcanic eruptions should be flagged regardless of the frequency of eruptions. In most

cases, however, the eruptions and resulting impact on air quality would be very infrequent.

SANDBLASTING (PM)

Definition:

Sandblasting or gritblasting refers to the temporary use of abrasive blasting with pressurized air for surface preparation purposes at a given location.

Methods currently available are used to control these operations to minimize their impact on air quality at fixed point sources where routine applications are part of the facilities' operations. Ambient air quality levels influenced by these activities should not be flagged. However, completely effective control techniques are not necessarily available or possible for portable sandblasting operations. Therefore, data collected at a site within a micro or middle scale distance from a temporary (generally 3 weeks or less) sandblasting operation may be flagged if all reasonable control measures have been employed to minimize adverse impacts on air quality.

FOREST FIRES (CO, PM)

Definition:

An uncontrolled fire in vegetation or associated flammable material that requires suppressive action to protect natural resources or values associated with natural resources or that is destructive to natural resources.[10]

Class	Size, acres	Class	Size, acres
A	≤0.25	D	100 - 299
B	0.26 - 9	E	300 - 999
C	10 - 99	F	1000 - 4999
		G	>5000

Some forest fires are unpreventable and because uncontrollable emissions from forest fire can adversely affect air quality concentrations over a large area, forest fires should be considered an exceptional event for the purpose of flagging air quality data. In general, Class A and B fires tend to have a more localized impact; therefore, only data collected at downwind monitors within 3 miles of these type fires should be flagged. For Classes C through G, the impact of the fire is more widespread and the location with respect to the monitor should be supported by receptor[11,12,13,14] or dispersion modeling.[15,16]

STRUCTURAL FIRES (CO, PM)

Definition:

Any accidental fire involving some kind of structure. In general, a structural fire involves a building having at least 600 square feet.

The structural fire should be within a micro- or middle-scale distance (up to 500 meters as defined by 40 CFR 58, Appendix D) of a monitor in most instances for the data from that monitor to be flagged. However, a much greater distance may be appropriate for large fires such as a refinery, industrial, or commercial business area fire provided the causal relation is supported by receptor or dispersion modeling.

HIGH POLLEN COUNT (PM)

Definition:

> A pollen count index above 25 grains/cm^2 or 1000 grains per cubic meter.[17]

The pollen count index is usually obtained by use of a coated slide mounted on a circular plate that is generally mounted on the top of a seven or eight-story building with an unobstructed air flow. The index is in units of grains of pollen per cm.[2] Another method of measuring the concentration of pollen is volumetric, i.e., counting the number of grains per cubic meter. Other recognized methods for measuring pollen levels may be used. For a high-pollen count to be flagged as an exceptional event, the pollen count index should be greater than 25, or 1000 grains per cubic meter and the high-volume filters on which the samples were collected should be analyzed microscopically to ensure that significant amounts of pollen (i.e., 50% or greater than the normal pollen count for a typical sample) were collected on the day or days being considered for flagging. Where high pollen is considered to be a problem, State or local agencies should develop procedures for ascribing the effects of high pollen count on filters and should submit them to the respective Regional Office for approval.

CHEMICAL SPILLS AND INDUSTRIAL ACCIDENTS (CO, SO_2, NO_2, PM)

Definition:

> Emissions that result from accidents such as fire, explosions, power outages, train derailment, vehicular accidents, or combinations of these.[18]

The spill or accident must, of course, not be a routine occurrence. Any of these situations that do occur routinely should be critically evaluated and

stopped. Data from sites that can be unequivocally related to a non-routine accident or spill may be flagged.

UNUSUAL TRAFFIC CONGESTION (CO)

Definition:

> A condition resulting from a major accident (rather than frequent minor accidents,) or short-duration obstruction, such as demolition or construction. During these conditions the level of traffic may increase until it exceeds the maximum capacity of a given street or highway. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of downstream congestion. In extreme cases, both speed and volume can drop to zero.[19]

As a general rule of thumb, congestion must occur within five hundred meters of a monitoring site (i.e., micro- to middle-scale) and not be a regular occurrence for the data from that site to be flagged.

CONSTRUCTION/DEMOLITION (PM)

Definition:

> The building/destroying/renovation of any residential, institutional, commercial, or industrial building (including apartment buildings with more than four dwelling units), structure, facility, or installation that lasts for only a short period of time and is reasonably controlled.

The construction or demolition activity must take place within a reasonable distance of the monitoring site and all reasonable control measures must be

in use before the data from the site can be flagged. Flagged data should be limited to sites classified as micro- or middle-scale (up to 500m) and downwind with respect to the construction activity.

AGRICULTURAL TILLING (PM)

Definition:

The act of preparing dry soil for cultivation or for controlling the growth of weeds by the use of mechanical devices during periods with an hourly average windspeed of greater than 20 mph.

Generally, agricultural tilling operations must occur within a reasonable distance (500 meters) of the monitoring site and tilling must have occurred at the same relative location while the hourly average windspeed is greater than 20 mph for the monitoring data to be flagged. Flagged data must have been collected during or immediately after the day tilling occurred and should be limited to sites which would be classified as micro- or middle-scale with respect to the tilling operations.

HIGHWAY CONSTRUCTION (PM)

Definition:

The act of building a new, or repairing an existing, highway, road or street.

Particulate matter resulting from reasonably controlled highway construction for short time periods may be flagged provided that a microscopic analysis of the filter indicates that 85 percent of material on the filter is related to construction activities and all reasonable control measures have been utilized.

REROUTING OF TRAFFIC (CO)

Definition:

A temporary deviation or detour of vehicular traffic because of an accident, construction, or demolition. The detour must be for no more than 1 week.

The rerouting of traffic should be within a reasonable distance of a monitoring site and last for no more than 1 week for the monitoring data to be flagged. Flagged data should be limited to sites classified as micro- or middle-scale (within 500 meters) with respect to the detour.

SALTING/SANDING OF STREETS (PM)

Definition:

The application of salt and/or sand to the road surface to increase traction and/or prevent the surface water from refreezing after it has melted.

The salting and sanding must occur within a reasonable distance (up to 500 meters) of the monitoring site if the data from the site are to be flagged. Flagged data should be limited to sites classified as micro- or middle-scale with respect to the salting/sanding operations and microscopic examination shows that 85 percent of the material on the filter is salt and/or sand. Data collection is not limited to the date of salting or sanding of the street. All reasonable control measures must be taken to minimize the adverse air quality impact of the salting or sanding operations in order for the data to be flagged. In general this type of data should not be flagged in areas which experience a significant use of salt and/or sand.

INFREQUENT LARGE GATHERINGS (CO, PM)

Definition:

A gathering of more than 10,000 people (5000 cars) at any one time and at a single location. Unusual traffic congestion must be associated with the event.

A large gathering in and of itself without the associated traffic congestion would not qualify as an unusual event for the purpose of flagging. (See discussion of unusual traffic congestion for more details on the criteria for flagging data because of unusual traffic congestion). The event would also be expected to occur less than once per year, and the event should be at a location not regularly used for such purposes. Flagged data should be limited to sites classified as micro- or middle-scale with respect to the gathering.

ROOFING OPERATIONS (PM, SO_2)

Definition:

The process of building, repairing, or recoating the external upper covering of a house or building that involves the application of a petroleum-based material (usually heavy residuals from a refining operation) to a roof. The material is heated and then sprayed or rolled onto the surface. Generally, a roof so covered would be resurfaced or treated no more than once every 3 to 5 years. Unless major damage has occurred, some surfaces would require treatment only every 5 to 10 years.

Roofing operations must occur within a micro-scale distance and upwind of the monitoring site, and all reasonable control measures must be applied for the data to be flagged.

PRESCRIBED BURNING (PM, CO)

Definition:

A controlled fire of vegetative material that is used to improve range lands, agricultural or forestry resources, or associated values.

Prescribed burning is generally a controlled activity that is limited to those days or periods when the meteorological conditions are conducive to good dispersion. Thus, the emissions which affect air quality are dispersed to the extent possible. However, the resulting emissions occasionally adversely affect air quality concentrations over a large area. In areas of the country where prescribed burning is used regularly and extensively for agricultural and/or forestry land management, prescribed burning may not be considered an exceptional event for the purposes of flagging air quality data. Prescribed burning in these areas is usually subject to rules and regulations, including smoke management plans, under which a regulatory agency permits burning after deciding where, and to what extent, the smoke will be allowed to impact air quality.

However, in many areas of the country, prescribed burning for agricultural, forestry land management, or other purposes is an infrequent but necessary activity and may be impractical to fully control. These practices may be considered an exceptional event for the purposes of flagging air quality data.

However, it must be demonstrated through receptor or dispersion modeling, that the burning operations have a substantial impact on the monitored air quality data.

CLEAN UP ACTIVITIES AFTER A MAJOR DISASTER (PM, CO, SO_2)

Definition:

For the purposes of flagging, major disasters are serious public misfortunes for which State or Federal relief has been granted.

PM, CO, SO_2 or other pollutant data affected by and collected during, or for a reasonable period after, the clean up activities following a major disaster may be flagged.

4.2 DEMONSTRATION OF CAUSAL RELATION

Excluding the use of valid air quality data from regulatory purposes is a serious action. Accordingly, a clear demonstration of the relationship between the exceptional event and the measured air quality must be provided. As a minimum, this demonstration should: (a) include all relevant raw data (e.g., air quality data, meteorological data, traffic counts, etc.); (b) show that the monitor did not record high concentrations before and after the period of the exceptional event; (c) show that the local wind direction was such that the monitored pollutant was transported from the exceptional event source to the monitor during the period in question; (d) include as appropriate receptor[11,12,13,14] or dispersion modeling[15,16] connecting the monitored concentrations with tne exceptional source emissions; (e) include, as appropriate, microscopic filter analyses (for particulate emissions); and (f) include documentation supporting the existence of the exceptional event.

4.3 APPLICATION OF DEFINITIONS AND/OR CRITERIA

As noted earlier, the purpose of this guideline is to provide guidance and direction for flagging air quality data associated with exceptional events and thus promote national consistency in the flagging of such data.

Having established general definitions for the exceptional events and the criteria for applying flags to the data, the State or local agency should consider flagging of any data meeting the criteria of this guideline and prepare adequate evidence to clearly demonstrate the causal relationship between the exceptional event and the flagged data. The flagged data with adequate documentation of the causal relationship should be submitted to the appropriate Regional Office following the procedures outlined in Sections 2.1 and 2.2. The Regional Office, after review, should notify the State or local agency of any disagreements, their reasons for disagreeing, and seek to resolve the conflict. Following their determination (concurrence or non-concurrence), the Regional Offices should notify AIRS and the State or local agency of their action so that the appropriate notation may be made to the AIRS data base and/or the Annual SLAMS Report.

The only exception to this policy is the flagging of stratospheric ozone intrusion. Because of the technical complexity of determining stratospheric ozone intrusion, OAQPS will, upon request by the State or local agency through the Regional Office, either concur or non-concur based on documentation submitted by the requestor.

The criteria (definitions) presented in this guideline will serve as the basis for reviewing determinations associated with exceptional events. If a State or local agency chooses to apply criteria that are less stringent than those contained in the guideline, such recommendation should be subjected

to public review. The recommendation, along with the summary of comments, should then be submitted to the respective Regional Office for review and approval. OAQPS will have final approval authority and, if approval is granted, will include the alternative criteria in a supplement to this national guideline.

4.4 DOCUMENTATION

All decisions regarding the flagging of data because of exceptional events must be documented so that the EPA and the public can review these decisions. The documentation may take several forms. It may include reports from the National Weather Service; a copy of a newspaper clipping or news report indicating that a chemical spill or industrial accident has occurred; a report from the local health department on the pollen count for a given day, supported by filter analyses; special reports prepared by the State or a consultant; or special statistical analyses of the air quality data and other key parameters associated with the event. The actual form of the documentation depends on the event and the extent of publicly available reports or documents that would support the determination of its occurrence. As appropriate, the State or local agency is encouraged to rely on available reports and documentation. When such documentation is not available, the State or local agency must prepare the necessary material sufficient (see Section 4.2) to support its decision regarding the flagged data.

The State or local agency should retain copies of the necessary supporting material or documentation in its offices for review upon request. Copies of this material will have to be available in the record during the public review process and must be provided to EPA for concurrence. It is not intended that a public review process (comment period or public hearing) be conducted

solely for the purpose of determining whether data should or should not be flagged. Instead, the public review process referred to in this guideline refers to the public review process which is otherwise required for regulatory actions taken in accordance with the Clean Air Act. Although the main purpose of the documentation is to support the decision to flag a given piece of data, it also provides air quality analysts with background and supporting information regarding the events associated with the data on which the analyst can rely if and when the data are needed to make a particular air quality decision. The air quality analyst will also be aware of any limitations that should be considered in the use of such data.

APPENDIX

DEVELOPMENT OF CRITERIA FOR EXCEPTIONAL EVENTS

The purpose of this appendix is to summarize the development history of this guideline and to assist users in understanding the information contained herein.

The Standing Air Monitoring Work Group (SAMWG) first addressed the issue of exceptional values and data flagging in December 1981. Subsequent to that time, SAMWG solicited input from EPA Regional Offices and State and local agencies to identify those exceptional events that could have any adverse effect on air quality values measured during their occurrence. The SAMWG also solicited input on how air quality measured during the exceptional event should be flagged. An initial list of possible exceptional events was compiled based on comments by selected Regional Offices and State and local agencies for further consideration.

I. IDENTIFICATION OF EVENTS

In general, the events given further consideration were grouped into three major categories: (1) natural events (meteorological and other natural events), (2) unintentional anthropogenic events, and (3) intentional anthropogenic events. The events within each major category were as follows:

1. Natural Events

   (a) Meteorological Events

   - Sustained high windspeeds (PM)
   - Stagnations/inversions (all pollutants)
   - Unusual lack of precipitation (PM)
   - Stratospheric ozone intrusion (O_3)

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   - o Sustained high windspeeds (PM)
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   - o Stratospheric ozone intrusion (O_3)

(b) Other Natural Events

- o Volcanic eruption (CO, SO_2, PM)
- o Forest fires (CO, PM)
- o High pollen count (PM)

2. Unintentional Anthropogenic Events

- o Large accidental structural fires (CO, PM)
- o Major traffic congestion due to accident or nonrecurring obstruction (CO)
- o Chemical spills (SO_2, NO_2, PM, CO)
- o Industrial accidents (SO_2, NO_2, PM, CO)

3. Intentional Anthropogenic Events

- o Short-term construction/demolition (PM)
- o Sandblasting (PM)
- o High-sulfur oil refining (SO_2)
- o Roofing operations (PM, SO_2)
- o Salting or sanding of streets (PM)
- o Infrequent large gatherings (PM, CO)
- o Soot blowing from ships (PM)
- o Agricultural tilling (PM)
- o Prescribed burning (CO, PM)
- o Noncompliance--point source (CO, SO_2, NO_2, PM)

Those whose comments and suggestions were solicited generally agreed that natural events, other than meteorological events, and unintentional anthropogenic events are, by their very nature, exceptional events. The control of emissions from such events is usually not included in the general control strategy for a given pollutant, although it is sometimes handled as part of an

emergency response action immediately after the event has occurred to minimize possible adverse health impacts on local residents. Reasonable precautions would not guarantee against recurrence or that the air quality would not be affected by these events in the future.

Some disagreement was expressed with regard to intentional anthropogenic events. Some argued that these events occur routinely and the data therefore should not be flagged. Others argued that, although intentional anthropogenic events occur routinely, they are exceptional with respect to normal activities around a particular monitoring site. Still others argued that intentional anthropogenic events can and should be controlled; they further argued that, unless these events or activities occur within the immediate vicinity of a monitoring site, they should not be considered as exceptional and the data collected during their occurrence should not be flagged.

Finally, some strong disagreement was expressed with respect to two meteorological events--stagnations and inversions. Many argue that these two events routinely occur. They further argue that because these events are climatological factors rather than exceptional events, pollutant levels measured during their occurrence should not be flagged.

The list of suggested exceptional events was reviewed and evaluated to determine whether each of the events listed should be considered exceptional and whether other events should be added. The review indicated that this list was comprehensive and that no additional events should be considered at this time.

After considerable discussion over an extended period of time, a general consensus was reached that 15 of the events initially considered for designation did generally satisfy the criteria for defining an exceptional event. Six of the events initially considered (implementing transportation controls,

stagnation/inversions, high-sulfur oil refining, sootblowing from ships, noncompliance--local sources, and unusual lack of precipitation) however, were finally rejected. The rationale for rejecting these events is summarized below.

II. EVENTS NOT CONSIDERED EXCEPTIONAL FOR DATA FLAGGING PURPOSES

1. Implementing Transportation Controls

Transportation control measures are not considered exceptional, and data collected during the implementation of transportation controls should not be flagged. If, however, traffic must be temporarily rerouted during the implementation of the transportation control measures or some congestion occurs due to initial startup of the transportation plan, the data collected at monitors near the rerouted traffic or congestion may be flagged.

2. Stagnations/Inversions

Stagnations and inversions are frequent climatological occurrences that must be considered in evaluating whether a control program is adequate to attain and maintain the NAAQS. An inversion is said to occur at a point, or through a layer, where temperature increases with increasing height.[20,21] Surface-based inversions are those that extend vertically from the surface to some altitude aloft. One study found that surface-based inversions generally occur about 32 percent of the time.[22] They are usually short-lived and disperse shortly after sunrise. Because inversions are expected to occur frequently and are part of weather patterns, they are not considered exceptional events for the purpose of flagging data.

Stagnation episodes are periods of 4 or more days with surface wind speeds of generally 4 m/sec or less and no precipitation or frontal passage. In some

parts of the United States stagnations usually persist for an extended period of time, and they can affect an entire air basin; therefore, they are not generally considered exceptional for the purpose of flagging data.

3. High-Sulfur Oil Refining

High-sulfur oil refining refers to the process of refining crude oil with a sulfur content that is 20 percent or greater than the design capacity of the refining operation. Because this is a common practice at many refineries, and procedures and control methods are used to minimize SO_2 emissions, it is not considered to be an exceptional event for the purpose of flagging data.

4. Sootblowing from Ships

Sootblowing from ships is a method in which air is used to remove deposits that may build up on the walls of the vessel's boiler tubes. This is a common practice that is either controlled or limited (in many areas of the country) by establishing opacity limits. Because these activities are common and steps can be taken to minimize associated emissions, sootblowing from ships (like general sootblowing from utility and industrial boilers) is not considered an exceptional event for the purpose of flagging data.

5. Noncompliance--Local Sources

Limited noncompliance of local sources can be expected from time to time as a result of process upsets or malfunctioning control equipment. These events are usually classified as "upsets" or "malfunctions" as defined by the applicable State or local agency regulations, or they may be considered a violation of applicable emission or opacity limits. If these events are caused by upsets or malfunctions, they should be so noted and reported to the appropriate control agency. If they constitute a violation, the appropriate

legal remedies will be taken. If legal action is taken, the air quality data collected in the vicinity of the source will in all likelihood be used in the legal proceedings, and any appropriate limitations associated with the data would be reviewed and evaluated as part of the legal process. Because data collected during noncompliance conditions have special uses and the source is required to notify the State of the upset or malfunction, noncompliance of local sources is not considered an exceptional event for the purpose of flagging data.

6. Unusual Lack of Precipitation

Lack of precipitation in and of itself would not be considered an exceptional event because it has very little impact on PM air quality levels. Lack of precipitation or drought conditions combined with high winds, however, would be considered an exceptional event. Therefore, unusual lack of precipitation is not considered an exceptional event for the purpose of flagging data.

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